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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,793	02/27/2004	Hung-Yi Huang	67,200-1215	9430

7590 12/07/2005

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EXAMINER

VAN, LUAN V

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 12/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

120

Office Action Summary

Application No.

10/789,793

Applicant(s)

HUANG, HUNG-YI

Examiner

Luan V. Van

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7-9, 12 and 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueno.

Regarding claims 1 and 7, Ueno teaches an electroplating apparatus comprising: a reservoir 1 for holding an electrolyte fluid (figure 2); an anode 4 and a cathode 7 for holding a wafer 6 provided in said reservoir 1; an electrical pathway 8 provided between said cathode and said anode; and a shield or auxiliary electrode 12 comprising a generally plate-shaped or disk (column 6 lines 16-18) shield body provided between said cathode and said anode.

Regarding claim 8-9, Ueno teaches an electroplating apparatus comprising of a copper shield (column 6 lines 21-23).

Regarding claim 12, Ueno teaches a method of electroplating a metal on a wafer comprising: providing a reservoir 1 containing an electrolyte fluid in figure 2; providing

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an anode 4 and a cathode 6 in said reservoir; providing an electrical pathway 8 between said cathode and said anode; providing a shield or auxiliary electrode 12 in said electrolyte fluid between said cathode and said anode; and applying a current to said cathode and said anode.

Regarding claim 19, Ueno teaches a method of electroplating wherein said shield comprises a generally plate-shaped or disk-shaped shield body (column 6 lines 16-18).

Regarding claim 20-21, Ueno teaches an electroplating method comprising of a copper shield (column 6 lines 21-23).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2-4 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno.

Regarding claims 2 and 13, although Ueno does not explicitly teach a shield comprises a ring-shaped shield body nor the method of using said shield, Ueno teaches that "The size and shape of the auxiliary electrode, the curve of the wafer opposing surface, and the like may be determined as appropriate so that uniform current densities and uniform electric lines of force are created on the wafer surface, and may be set as appropriate in accordance with the characteristics of the plating apparatus. The auxiliary electrode is not limited to those disks having holes as employed in the foregoing embodiments, and may use various materials such as mesh-like ones. A disk used as the auxiliary electrode is not necessarily provided with the holes for letting the plating solution therethrough" (column 6 lines 6-23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the shield of Ueno to a ring-shaped shield, because the appropriate size and shape can be determined by one of ordinary skill in order to provide uniform current densities on the wafer surface, and because changes in shape would be a matter of design choice within the ability of one having ordinary skill (MPEP 2144.04).

Regarding claim 3-4 and 14-15, Ueno teaches an electroplating apparatus and method comprising of a copper shield (column 6 lines 21-23).

Claims 6, 11, 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno in view of Broadbent.

Ueno teaches the apparatus and method as described above in addressing claim(s) 1, 7 and 12.

The difference between the reference to Ueno and the instant claims is that the reference does not explicitly teach a shield comprising of an electrically nonconductive material.

Broadbent teaches that a shield is preferably made of an electrically nonconductive material, because it is resistant to the acid bath (column 3 lines 66-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus and method of Ueno by using the shield comprising of an electrically nonconductive material as taught by Broadbent, because it would be resistant to the plating bath.

Claims 5, 10, 16, 17, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno in view of Cheng et al.

Ueno teaches the apparatus and method as described above in addressing claim(s) 1, 7 and 12. In addition, Ueno teaches applying a positive charge to the shield to control the current densities on the wafer surface.

The difference between the reference to Ueno and the instant claims is that the reference does not explicitly teach applying a negative charge to the shield.

Cheng et al. teach applying a negative charge to the shield 40 (figure 1) to control the current densities in order to improve the thickness uniformity.

Regarding claim 5 and 10, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Ueno by applying a negative charge to the shield as taught by Cheng et al., because it would improve the thickness uniformity.

Regarding claim 16, 17, 22 and 24, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Ueno by applying a negative charge to the shield as taught by Cheng et al., because it would improve the thickness uniformity.

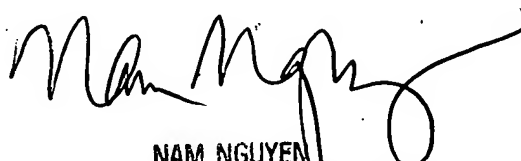
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LWV
11/30/05


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
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